APPENDIX 1 - **Yamhill Watershed Road Stabilization and Watershed Restoration Project Issue Disposition**

BLM Responses to Public Comments
which resulted from the May 17, 2001 Scoping Report

Project Report Document 6 - comment #1
Greg Miller, Oregon Dept. of Forestry, Forest Grove, OR.

> "The road in question is that portion of the 4-7-36 road north from its junction with the 4-7-18 road. This road provides the only access through two parcels of State-owned land west of Willamina Creek in Section 18, T4S R6W. A commercial Thinning operation is planned in this area in the near future."
>
> "I request that you reconsider the proposed treatment for the portion of the 4-7-36 road from its junction with the 4-7-18 road to the north line of Section 18."
>
> BLM RESPONSE:
> The proposed treatment for the segment of road 4-7-36 that you address has been changed to "No Treatment". This will provide the continued access to State lands in Section 18 that you are requesting.

APPENDIX 2 - EFFECTS ON WILDLIFE SPECIES OF CONCERN
Environmental Assessment Number OR-086-01-05

Project: Yamhill Watershed Road Stabilization and Watershed Restoration Project				
Common Name	**ESA**	**NFP**	**BLM**	**Expected Impacts**
Mammals:				
Columbian White-tailed Deer	FE	-	FE	*No Effect* - not within the species' range.
Fisher	-	-	BS	None or minimal impact - Suitable habitat may be prese although it is very unlikely that the species is present. D to the nature of the project potential impacts would be expected to be only temporary noise disturbance. The project will have negligible effect upon the population viability.
Fringed Myotis Long-eared Myotis Long-legged Myotis Silver-haired Bat	-	ROD	BT	No or minimal impact- Suitable bat habitat may be present within the vicinity of some of the project areas and it is possible that these species are present. The project is not expected to impact any potential bat habita Due to the nature of the project, potential impacts would be expected to be only temporary noise disturbance. The project will have no effect upon population viability.
Townsend's Big-eared Bat	-	-	BS	No or minimal impact- Suitable habitat may be present within the vicinity of some of the project areas and it is possible that this species are present. The project is not expected to impact any potential bat habitat. Due to the nature of the project, potential impacts would be expecte to be only temporary noise disturbance. The project will have no effect upon population viability.
Red Tree Vole	-	S&M	-	No or minimal impacts expected - The project is not expected to be "ground disturbing" relative to Red tree vole based upon the projects' design features and the fa that suitable vole habitat will not be impacted. If, durin project implementation, it is determined that an individu project site would result in potential impacts to suitable vole habitat, surveys would be conducted according to protocol and any newly discovered sites would be managed in accordance with Bureau policy.
Birds:				
Aleutian Canada Goose	FT	-	FT	*No Effect* - not within the species' range
Bald Eagle	FT	-	FT	Minimal impact - The project will not impact the quality of eagle habitat within the area. Activities within 0.25 miles of suitable habitat which generate noise above the ambient level or are within a 0.5 miles of line-of-sight o an occupied eagle nest or unsurveyed suitable habitat during the eagle nesting period (January 1 - August 31) *may affect and are not likely to adversely effect* the bald eagle. ESA Section 7 consultation with the USFWS wi be conducted annually via the streamlined programmati consultation process. Design features will comply with the Terms and Conditions of the 2001 Programmatic Biological Opinion.
Brown Pelican	FE	-	FE	*No Effect* - not within the species' range.
Harlequin Duck	-	-	BA	None - the project will not impact the species or its habitat.
Lewis' Woodpecker	-	-	BS	None - the project will not impact the species or its

				habitat.
Marbled Murrelet	FT	-	FT	Minimal impact - The project will not impact murrelet critical or suitable habitat within or near the project area The project will be of *no effect* upon designated critical habitat. Daily time restrictions during the entire murrele breeding season are incorporated into the project design reduce the potential for disturbance. Activities within 0. miles of suitable habitat which generate noise above the ambient level during the murrelet critical nesting period (April 1 - August 5) *may affect and are likely to adverse effect* the murrelet, while those activities occurring with the non-critical nesting period (August 6 - September 15 *may affect but are not likely to adversely effect* the murrelet. ESA Section 7 consultation with the USFWS will be conducted annually via the streamlined programmatic consultation process. Design features wi comply with the Terms and Conditions of the 2001 Programmatic Biological Opinion.
Northern Spotted Owl	FT	-	FT	Minimal impact - The project will not impact the quality of spotted owl critical or suitable habitat within or near the project areas; The project will be of *no effect* upon designated critical habitat. Activities within 0.25 miles suitable habitat which generate noise above the ambient level during the owl critical nesting period (March 1 - Ju 7) *may affect and are likely to adversely effect* the spotte owl, while those activities occurring with the non-critica nesting period (July 8 - September 30) *may affect but ar not likely to adversely effect* the spotted owl. ESA Section 7 consultation with the USFWS will be conduct annually via the streamlined programmatic consultation process. Design features will comply with the Terms ar Conditions of the 2001 Programmatic Biological Opinic
Northern Goshawk	-	-	BS	No or minimal impact - suitable habitat may be present although it is very unlikely that the species is present. The project will have negligible effect upon the population viability.
Peregrine Falcon	-	-	BS	None - the project will not impact the species or its habitat.
Purple Martin	-	-	BS	None - the project will not impact the species or its habitat.
Yellow-breasted Chat (WV)	-	-	BS	No or minimal impact - Due to the nature of the project, potential impacts upon this species would be expected t be only temporary noise disturbance. The project will have no effect upon population viability.
Reptiles and Amphibians:				
Columbia Torrent Salamander	-	-	BS	No or minimal impact - Suitable stream habitats may be present in the project area in association with some of th proposed culvert removals or repair of road damage. While the project may impact individual animals, it will have negligible effect upon the population viability.
Cope's Giant Salamander	-	-	BA	None - not within the species' range.
Oregon Spotted Frog	FC	-	FC	None - not within the species' range.
Painted Turtle	-	-	BS	None - suitable habitat is not present within the project area.
Western Pond Turtle	-	-	BS	None - suitable habitat is not present within the project

				area.
Invertebrates:				
(Arthropods and Worms) There is no suitable habitat present for any of the invertebrates covered by the ESA or the Bureau's 6840 Special Status Species Policy. As a result, no impacts to the species would be expected.				
American Acetropis Grass Bug	-	-	BS	none
Insular Blue Butterfly	-	-	BS	none
Oregon Giant Earthworm	-	-	BS	none
Oregon Silverspot Butterfly	FT	-	FT	none
Roth's Blind Ground Beetle	-	-	BS	none
Taylor's Checkerspot Butterfly	-	-	BS	none
Valley Silverspot Butterfly	-	-	BA	none
Willamette Callippe Fritillary Butterfly	-	-	BS	none
(Survey and Manage Mollusks) The project will not be "habitat disturbing" relative to S&M mollusks based upon the fact that suitable mollusk habitat will not be impacted.				
Evening Fieldslug	-	S&M	-	No impacts expected
Keeled Jumping-slug	-	S&M	-	No impacts expected
Oregon Megomphix	-	S&M	-	No impacts expected
Crater Lake Tightcoil	-	S&M	-	No impacts expected
Puget Oregonian	-	S&M	-	No impacts expected
Warty Jumping-slug	-	S&M	-	No impacts expected

ESA - Endangered Species Act: **FE** - Federal Endangered; **FT** - Federal Threatened; **FC** - Federal Candidate

NFP - Northwest Forest Plan: **S&M** - Survey and Manage; **ROD** - Bat species whose roost sites are protected in the ROD

BLM - 6840 Policy list: **BS** - Bureau Sensitive; **BA** - Bureau Assessment; **BT** - Bureau Tracking

APPENDIX 3 - ENVIRONMENTAL ELEMENTS
Environmental Assessment Number OR-086-01-05

In accordance with law, regulation, executive order and policy, the Yamhill Watershed Road Stabilization and Watershed Restoration Project interdisciplinary team reviewed the elements of the environment to determine if they would be affected by the proposed action described in Chapter 2 of the EA (environmental assessment). The following two tables summarize the results of that review.

Table 1. Critical Elements of the Environment. This table lists the critical elements of the environment which are subject to requirements specified in statute, regulation, or executive order and the interdisciplinary team's predicted environmental impact per element if the proposed action described in Chapter 2 of the Environmental Assessment was implemented.

CRITICAL ELEMENTS OF THE ENVIRONMENT	ENVIRONMENTAL EFFECT	INTERDISCIPLINARY TEAM'S COMMENTS
Air Quality	Minimal Effect	This element was not identified as a major issue. The major source of potential air pollutants associated with the proposed action is dust from the use of gravel roads and road stabilization activities. (Salem District Resource Management Plan Final Environmental Impact Statement, p. Chapter 4-8). There are no rural residences located in the vicinity of the roads proposed for treatment. Dust created from vehicle traffic on gravel roads, and other road stabilization repair activities is predicted to be localized and of short duration. As such, the proposed action would have no adverse impact on air quality and would comply with the provisions of the Clean Air Act.
Areas of Critical Environmental Concern	None	This element was not identified as a major issue. The Butte, Sheridan Peak, and Yampo ACECs are located within or near the project area. The project is consistent with the management plans for these ACECs.
Cultural, Historic, Paleontological	None	This element was not identified as a major issue. There are no known cultural sites that would be affected by the proposed action. Pursuant to the August 1998 protocol for managing cultural resources on land administered by the BLM in Oregon, cultural resource surveys will be conducted prior to any new ground-disturbing activity. If cultural resources are found, the project(s) may be redesigned to protect the cultural resources values present or evaluation and mitigation procedures would be implemented based on the recommendation of the District archaeologist.

Native American Religious Concerns	None	This element was not identified as a major issue. Tribes were contacted during scoping and no concerns were identified (Project Record document 2).
Threatened or Endangered Plant Species	Minimal Effect	This element was not identified as a major issue. No suitable habitat for T&E plant species will be affected by the proposed action.
Threatened or Endangered Wildlife Species or Habitat	Minimal Effect *May Effect* the spotted owl, marbled murrelet, and bald eagle due to the potential for disturbance. Also see Appendix 2 - Effects on Wildlife Species of Concern for additional information.	This element was not identified as a major issue. The only potential impacts to Threatened or Endangered Wildlife Species located within or near the project area are associated with disturbance. Consultation on potential impacts will occur annually under the Programmatic Biological Assessment for Disturbance. Also see Appendix 2 - Effects on Wildlife Species of Concern for additional information.
Threatened or Endangered Fish Species or Habitat	Minimal Effect *"May Affect, Likely to Adversely Affect",* Upper Willamette Steelhead and *"May Affect, Not Likely to Adversely Affect"* Upper Willamette chinook salmon and *"May Affect, Not Likely to Adversely Affect"* critical habitat for either species. See Chapter 3 of the EA.	The proposed actions are included in the *Programmatic Biological Assessment (BA) for On-going USDA Forest Service and USDI Bureau of Land Management Activities Affecting Upper Willamette Steelhead Trout and Chinook Salmon within the Willamette Province (above Willamette Falls), Oregon*, which was submitted to National Marine Fisheries Service (NMFS) May 1999. A Biological Opinion (BO) covering the actions described in the programmatic BA was received from NMFS on July 28, 1999, and a new Incidental Take Statement (ITS) for the programmatic BO was issued on June 5, 2000 and is valid through September 30, 2001.
Prime or Unique Farm Lands	None	This element was not identified as a major issue. There is no prime or unique farm lands located within the project area.
Flood Plains	None	This element was not identified as a major issue. There are no flood plains that will be affected by the proposed action.
Hazardous or Solid Wastes	None	This element was not identified as a major issue. There is not predicted to be any environmental effects associated with this element due to the implementation of the Best Management Practices contained in the *Salem District Resource Management Plan* and the terms/conditions of the Road Stabilization contract.
Water Quality	Minimal Effect -	Impacts to surface water quality was not identified

(Surface and Ground)	See Chapter 3 of the EA	as a major issue. See Chapter 3 of the EA for a detailed analysis of the impacts to water quality.
Wetlands/Riparian Zones (Executive Order 11990, Protection of Wetlands, 5/24/77)	Minimal Effects	This element was not identified as a major issue. While the project proposes to treat roads within Riparian Reserves, project design features such as erosion control measures and limiting activities to periods of low soil moisture assure the protection of wetland and riparian zones. Also see Chapter 3.
Wild and Scenic Rivers	None	This element was not identified as a major issue. There are no wild or scenic rivers within the project area.
Wilderness	None	This element was not identified as a major issue. There is no wilderness located within the project area.
Invasive, Nonnative Species (includes Executive Order 13112, Invasive Species, 2/3/99)	Minimal Effect	This element was not identified as a major issue. See Chapter 3.
Environmental Justice (Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations, 2/11/94)	Minimal Effect	This element was not identified as a major issue. The proposed action would result in minimal impact to the local economies. The proposed action is not anticipated to have disproportionately high and adverse human health or environmental effects on minority populations and low-income populations.

Table 2. Other Elements of the Environment. This table lists other elements of the environment which are subject to requirements specified in law, regulation, policy, or management direction and the interdisciplinary team's predicted environmental impact per element if the proposed action described in Chapter 2 of the Environmental Assessment was implemented.

ELEMENTS OF THE ENVIRONMENT	ENVIRONMENTAL EFFECT	INTERDISCIPLINARY TEAM=S COMMENTS
Land Uses (including mining claims, mineral leases, etc.)	None	This element was not identified as a major issue. The proposed action would have no effect on land uses such as mining claims or mineral leases.
Minerals	None	This element was not identified as a major issue. The proposed action does not include the extraction of any mineral resource. As

		such, this element would not be affected by the proposed action.
Recreation	Minimal Effects - see chapter 3 of the EA	This element was not identified as a major issue. See Chapter 3.
Soils	Minimal Effects - see chapter 3 of the EA	This element was not identified as a major issue. See Chapter 3.
Visual Resources	None	This element was not identified as a major issue. The proposed action is within VRM categories I, II, III and IV. The project has been determined to be consistent with the visual resource management objectives for these classifications.
Water Resources (including Aquatic Conservation Strategy Objectives, beneficial uses [Salem FEIS Chapter 3-9], DEQ 303d listed streams, water temperature, sedimentation, water quantity, etc.)	Minimal Effects - see chapter 3 of the EA	This element was not identified as a major issue. See Chapter 3 and Appendix 6 (ACS Objectives) in the EA.
Bureau Sensitive and Special Attention Plant Species/Habitat (including Survey and Manage, and protection buffer species)	Minimal Effect - see chapter 3 of the EA	This element was not identified as a major issue. See Chapter 3 in the EA.
Bureau Sensitive and Special Attention Wildlife Species/Habitat (including Survey and Manage mammals and mollusks)	Minimal Effect - see Chapter 3 of the EA.	This element was not identified as a major issue. See Chapter 3 and Appendix 2 in the EA.
Fish Species with Bureau Status and Essential Fish Habitat	Minimal Effect - see Chapter 3 of the EA	This element was not identified as a major issue. See Chapter 3 and Appendices 5 and 6 in the EA.
Rural Interface Area	None	This element was not identified as a major issue. There are no rural interface areas located within the project area.
Coastal Zone (affect on Aany land or water use or natural resource of the coastal zone.@ The determination of effects should include Adirect, indirect, cumulative, secondary, and reasonably foreseeable effects@)	None	This element was not identified as a major issue. The project area is not located within Oregon's Coastal Zone boundary.

Late-Successional Reserve Objectives (C-11, C-16)	Minimal Effect	The stabilization or decommissioning of roads within the LSR would have an overall beneficial effect on the creation and maintenance of late-successional habitat and associated species. As such, the proposed action would not retard or prevent the attainment of the LSR objectives.

APPENDIX 4

PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE ACTIONS

Environmental Assessment Number OR-086-01-05

The past, present, and reasonably foreseeable future actions within the affected watersheds are listed below. The actions which are common to all the watersheds are listed separately from those actions which are pertinent to an individual watershed. The cumulative effects of the past, present, and reasonably foreseeable future actions in relation to the relevant environmental elements will be analyzed in Chapter 3 of the Environmental Assessment.

Common to All Affected Watersheds

Past Actions: * homestead settlement * high rate of logging in the 20th century with associated actions including railroad logging, splash dams, snag felling, construction of roads, milling, and blasting rock/removal of large wood from stream channels * beaver eradication * management of young plantations * placement or creation of coarse woody debris and wildlife tree projects * changes in logging volumes * recreational use including camping, hunting, fishing, target practicing, rockhounding, sightseeing, hiking, and motorcycle and bicycle riding * minor amount of mineral extraction (primarily gravel) * primary and secondary residential development * agriculture *grazing *gathering of special forest products such as landscape transplants, floral greenery (i.e., mosses, ferns, salal, and tree boughs), Christmas trees, seed cones, berries, mushrooms, western red cedar shake bolts, and firewood * municipal, irrigation, and domestic uses of water * some resource theft, vandalism, and refuse dumping * fire, including prescribed fire* road construction and maintenance**.**

Present Actions: * logging with harvest rates below historic levels * management of young plantations * recreational use including camping, hunting, fishing, target practicing, sightseeing, and off-highway vehicle * recreational use proportional to in-migration, free time and economic affluence* agriculture * industry * creation of coarse woody debris and wildlife tree projects * minor amount of gathering of special forest products such as mushrooms, firewood, mosses and other floral greenery, and landscape vegetation * vandalism, resource thefts, and garbage dumping * law enforcement monitoring * in-migration * rural and urban development in proportion to availability of land in urban growth boundaries and/or political pressure to incorporate existing forest or agricultural land into the urban growth boundaries * road maintenance activities * storm events.

Reasonably Foreseeable:* logging on private and state land with the assumption that much of the merchantable-aged timber will be harvested in accordance with the Oregon Forest Practices Act within the next ten years and the resultant clearcuts would then be managed (thinning, spraying herbicides, etc.) * increased road density on private industrial lands to support logging operations planned for the next several years * a no

net-gain of road densities on federal lands * predicted flattening of in-migration * rural and urban development in proportion to availability of land in urban growth boundaries and/or political pressure to incorporate existing forest or agricultural land into the urban growth boundaries * recreational use including camping, hunting, fishing, target practicing, and sightseeing * increased road density proportional to residential development * use of the existing roads for accessing employment, recreation, and long distance driving in proportion to in-migration and tourism, as well as timber hauling * maintenance or improvements of existing roads * logging and other silvicultural treatments on BLM land at current levels * no new mineral extraction, except gravel, due to the low quality and/or quantity of minerals * gathering of special forest products such as mosses, mushrooms, fire and landscaping vegetation at or above current levels * vandalism, resource thefts, and refuse dumping * continued law enforcement monitoring * storm events * control measures applied on exotic plants and noxious weeds along roadside and in regeneration areas * implementation of some stream enhancement projects by ODFW, private landowners, or others * wildlife habitat enhancement projects.

APPENDIX 5 - CHECKLIST FOR DOCUMENTING ENVIRONMENTAL BASELINE AND EFFECTS OF PROPOSED ACTION(S) ON RELEVANT INDICATORS AT THE 5TH-FIELD WATERSHED

Administrative Unit: **Salem District BLM, Tillamook Resource Area**
5th field watershed: **Willamina Creek**
Project: **Yamhill Watershed Road Stabilization and Watershed Restoration**

FACTORS INDICATORS	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)		
	Properly Functioning	At Risk	Not Proper. Functioning	Restore	Maintain	Degrade
Water Quality: Temperature			DEQ		A,B	
Turbidity		WA; PJ	PJ	B[2]		A,B[2]
Chem. Contam./Nut.		WA	DEQ		A,B	
Overall (303d reaches)			DEQ		A,B	
Habitat Access: Physical Barriers			WA, PJ	B	A	
Habitat Elements: Substrate/Sediment		ODFW		B[2]		A,B[2]
Large Woody Debris (LWD)			WA		A[1],B	A[1]
Pool Area %		ODFW			A[1],B	A[1]
Pool Quality	ODFW				A[1],B	A[1]
Pool Frequency	ODFW				A[1],B	A[1]
Off-Channel Habitat			ODFW		A[1],B	A[1]
Channel Cond. & Dyn.: Streambank Condition		ODFW			B	A
Floodplain Connectivity		WA; PJ			B	A
Watershed Condition: Road Des. & Loc.			BLM	B	A	
Disturbance History			WA; PJ	B		A
Stream Influence Zone			WA; PJ	B		A
Refugia		ODFW; WA			A[1],B	A[1]

WA = Watershed Analysis
PJ = professional judgement
ODFW= Oregon Department of Fish and Wildlife habitat data
DEQ = Department of Environmental Quality 303d list
BLM = BLM data

A = No Action
B = Road Stabilization/Restoration

[1] = short-term Maintain, long-term Degrade
[2] = short-term Degrade, long-term Restore

Data used in this analysis was collected by ODFW on 21.7 miles of stream within the Willamina Creek 5th field watershed. Data was collected in 1991, 1995, and 1996.

Water Quality

Temperature: The limited water temperature data available for Willamina Creek indicates that water temperatures likely exceed state standards during the summer months. This baseline condition for this indicator is rated **Not Properly Functioning**.

Alternative 1 (No Action): No road stabilization would occur. No change in the current condition of stream water temperature would occur. **Maintain**.

Alternative 2 (Road Stabilization and Watershed Restoration): Vegetation along streams providing canopy cover would not be removed, except possibly at some of the culvert removal sites. These potential areas of vegetation removal would be small and would not impact water temperature. **Maintain**.

Turbidity: Data collected by ODFW stream survey in 1991, 1995 and 1996 on Willamina Creek and Coast Creek indicated a stream bank erosion rate of 12%. Watershed analysis states that bank erosion is likely a major contributor to stream sediment load, with erosion potential greatest in the lower reaches. In the lower watershed and especially urban areas streambanks are not well vegetated and some are actively eroding. Stream turbidity levels have been observed to be quite high during winter storm events, which is common in this basin. A lack of large woody debris and associated structural elements in Willamina Creek indicates that sediment storage and routing processes have been disrupted. This indicator is **Not Properly Functioning.**

> **Alternative 1 (No Action)**: There would be no sidecast removal, waterbar construction, or road blocking at this time on the roads proposed for treatment under the action alternatives. These roads would receive little or no maintenance in the future, and would soon become blocked with debris or overgrown with brush. Culverts, cross-drains and ditches would become partly or fully blocked with debris and would either not function at all or function at a reduced level. The end result would be that during winter storms many of these structures would fail and there would be road damage ranging from ditch and road surface erosion to complete road fill failures (landslides). This would lead to direct sediment input into stream channels and likely elevate turbidity levels above natural levels. **Degrade**.
>
> **Alternative 2 (Road Stabilization and Watershed Restoration)**: Stabilizing and blocking of roads would reduce or eliminate the erosion that has been occurring and is expected to occur. Sidecast removal, waterbar construction, culvert removal and ripping roads all have the potential to add sediment to streams and increase turbidity in the short-term. However, by restricting ground-disturbing work to the period of low soil moisture, limiting instream work to ODFW instream work windows, disposing of waste in stable locations away from streams and floodplains, controlling sediment movement with vegetated filter strips or structures such as straw bales, and seeding disturbed areas with native or sterile grass seed, very little, if any, increase in turbidity is anticipated. Over the long-term, stabilizing roads is expected to reduce turbidity within the watershed by minimizing or eliminating impacts (erosion and landslides) from the roads identified for treatment. Possible short-term **Degrade**, long-term **Restore.**

Chemical Contamination/Nutrient Input: A portion of Willamina Creek is listed (303d) for recreation contact fecal coliform bacteria, so this indicator is rated as **Not Properly Functioning**.

> **Alternative 1 (No Action)**: No change would occur as a result of not implementing any actions. **Maintain.**
>
> **Alternative 2 (Road Stabilization and Watershed Restoration)**: No change would occur as a result of implementing this action. **Maintain**.

Overall (303d reaches): Willamina Creek has segments that are listed on the 303d list for bacteria. **Not Properly Functioning.**

> **Alternative 1 (No Action)**: No change in 303d listings is expected as a result of not implementing any actions. **Maintain**.
>
> **Alternative 2 (Road Stabilization and Watershed Restoration)**: No change in 303d listings is expected as a result of implementing this action. **Maintain**.

Habitat Access

Physical Barriers: Within the watershed there are barriers to fish passage and as such is considered **Not Properly Functioning**.

> **Alternative 1 (No Action)**: No action would be implemented, therefore any barriers would remain. **Maintain**.

Alternative 2 (Road Stabilization and Watershed Restoration): Many of the roads identified for stabilization are located high in the watershed where streams are generally not fish-bearing due to steep gradient and/or small size, however it is likely that some of the culverts that would be removed are on fish-bearing streams and are currently blocking fish passage. **Restore**.

Habitat Elements

Substrate/Sediment: Analysis of ODFW data available for the Willamina Creek Watershed shows sand and organic substrate making up 18.4%, gravel at 41.5%, cobble at 25.2% boulders and bedrock at 15%. This reach is considered **At Risk**

Alternative 1 (No Action): There would be no sidecast removal, waterbar construction, or road blocking at this time on the roads proposed for treatment under the action alternatives. These roads would receive little or no maintenance in the future, and would soon become blocked with debris or overgrown with brush. Culverts, cross-drains and ditches would become partly or fully blocked with debris and would either not function at all or function at a reduced level. The end result would be that during winter storms many of these structures would fail and there would be road damage ranging from ditch and road surface erosion to complete road fill failures (landslides). This would lead to direct sediment input into stream channels and likely increase sediment in riffles downstream, as well as increasing bedload movement. **Degrade**.

Alternative 2 (Road Stabilization and Watershed Restoration): Stabilizing and blocking of roads would reduce or eliminate the erosion that is expected (and has been occurring). Sidecast removal, waterbar construction, culvert removal and ripping roads all have the potential to add a small amount of sediment to streams in the short-term. However, by restricting ground-disturbing work to the period of low soil moisture, limiting instream work to ODFW instream work windows, disposing of waste in stable locations away from streams and floodplains, controlling sediment movement with vegetated filter strips or structures such as straw bales, and seeding disturbed areas with native or sterile grass seed, very little, if any, increase in sediment is anticipated. Over the long-term, stabilizing roads is expected to reduce sediment input into streams within the watershed by minimizing or eliminating impacts (erosion and landslides) from the roads identified for treatment. Possible short-term **Degrade**, long-term **Restore.**

Large Woody Debris: Due to past timber harvest, valley bottom roads, homesteading activity, fire and other management actions, Willamina Creek is deficient in large woody debris (BLM Watershed Analysis, 1998). The standard for key pieces of large wood is 80 pieces/mile that are at least 24 inches in diameter and 50 feet in length. Wood this size was recorded in the ODFW habitat survey in the amount of 17.6 pieces per mile over the 21.7 miles surveyed, which is about 22% of the desired number. For these reasons this indicator is considered **Not Properly Functioning**.

Alternative 1 (No Action): Generally, not implementing any actions would maintain the current amount of large wood in the stream channel in the short-term. However as culverts become blocked and/or blow out due to lack of maintenance several things are likely to occur. The culverts currently block the natural movement of large wood downstream. The eventual failure of the culverts and road fills is likely to lead to landslides and debris torrents above natural levels (greater frequency and severity). These may help deliver wood to downstream sites, but they may also move the wood farther through the system than would occur naturally or move the wood out of the stream channel and floodplain. Short-term **Maintain**, possible long-term **Degrade**.

Alternative 2 (Road Stabilization and Watershed Restoration): Stabilizing roads by removing culverts, removing most of the fill over culverts, and adding waterbars would help water and associated debris flow more naturally than if the roads are left in their current condition. Large wood would be moved through the system more naturally, and more wood may be delivered to sites downstream though the total amount of large wood in stream channels throughout the watershed would remain the same. **Maintain**.

Pool Area %: The upper portions of the Willamina Creek watershed are considered for this analysis to be basaltic headlands and these areas are where the data is available, however the lower portion of this watershed are sedimentary in nature. Pools make up 34 % of the stream habitat area which almost meets the properly functioning standard of 35% pool area . **At Risk**.

Alternative 1 (No Action): There would be sidecast removal, waterbar construction, or road blocking at this time on the roads proposed for treatment under the action alternatives. These roads would receive little or no maintenance in the future, and would soon become blocked with debris or overgrown with brush. Culverts, cross-drains and ditches would become partly or fully blocked with debris and would either not function at all or function at a reduced level. The end result would be that during winter storms many of these structures would fail and there would be road damage ranging from ditch and road surface erosion to complete road fill failures (landslides). This could lead to downcutting of higher gradient stream channels, and excess substrate delivery/deposition in the lower gradient stream channels, both which may lead to a reduction of the amount of pool habitat within the watershed. Short-term **Maintain**, long-term **Degrade**.

Alternative 2 (Road Stabilization and Watershed Restoration): Stabilizing and blocking of roads would reduce the potential for landslides and debris flows to occur; some would still occur, but at a more natural frequency. The current amount of pool habitat would be retained. **Maintain**.

Pool Quality: 24% of the surveyed pools are greater than 1 m deep. **Properly Functioning**

Alternative 1 (No Action): There would be no sidecast removal, waterbar construction, or road blocking at this time on the roads proposed for treatment under the action alternatives. These roads would receive little or no maintenance in the future, and would soon become blocked with debris or overgrown with brush. Culverts, cross-drains and ditches would become partly or fully blocked with debris and would either not function at all or function at a reduced level. The end result would be that during winter storms many of these structures would fail and there would be road damage ranging from ditch and road surface erosion to complete road fill failures (landslides). This would lead to downcutting of higher gradient stream channels, and excess substrate delivery/deposition in the lower gradient stream channels, both which may lead to a reduction of the amount of quality pool habitat within the watershed. Short-term **Maintain**, long-term **Degrade**.

Alternative 2 (Road Stabilization and Watershed Restoration): Stabilizing and blocking of roads would reduce the potential for landslides and debris flows to occur; some would still occur, but at a more natural frequency. The current amount of quality pool habitat would be retained. **Maintain**.

Pool Frequency: There are approximately 8.1 active channel widths between pools. **Properly Functioning**.

Alternative 1 (No Action): There would be no sidecast removal, waterbar construction, or road blocking at this time on the roads proposed for treatment under the action alternatives. These roads would receive little or no maintenance in the future, and would soon become blocked with debris or overgrown with brush. Culverts, cross-drains and ditches would become partly or fully blocked with debris and would either not function at all or function at a reduced level. The end result would be that during winter storms many of these structures would fail and there would be road damage ranging from ditch and road surface erosion to complete road fill failures (landslides). This would lead to downcutting, especially in higher gradient stream channels, and excess substrate delivery/deposition in the lower gradient stream channels, both which may lead to a reduction of the amount of pools within the watershed. Short-term **Maintain**, long-term **Degrade**.

Alternative 2 (Road Stabilization and Watershed Restoration): Stabilizing and blocking of roads would reduce the potential for landslides and debris flows to occur; some would still occur, but at a more natural frequency. The current pool frequency would be retained. **Maintain**.

Off-Channel Habitat: Off-channel habitat makes up virtually none of the habitat in surveyed reaches. **Not Properly Functioning**.

Alternative 1 (No Action): The amount of off-channel habitat would remain the same in the short-term if no actions were implemented. In the long-term, increased failure of culverts and road fills are expected as a result of taking no action, which would lead to increased landslide and debris flow activity. Though landslides and debris flows are natural processes, leaving the roads in their current condition is likely to increase the frequency and severity of these processes above the natural level. This may reduce off-channel habitat though downcutting of stream channels which would reduce floodplain connectivity, and excessive deposition which may fill in alcoves or other off-channel habitat. Short-term **Maintain**, long-term **Degrade**.

Alternative 2 (Road Stabilization and Watershed Restoration): Stabilizing and blocking of roads would reduce the potential for landslides and debris flows to occur; some would still occur, but at a more natural frequency. The current amount of off-channel habitat is expected to be retained. **Maintain**.

Channel Conditions

Streambank Condition: Approximately 12% of streambanks were recorded as actively eroding, however streambank erosion in the lower watershed is noted a concern. **At Risk.**

Alternative 1 (No Action): Not implementing any projects would maintain the current streambank condition in the short-term. Increased failure of culverts and road fills are expected as a result of taking no action, which would lead to increased landslide and debris flow activity. Landslides and debris flows would cause bank erosion, increasing the amount of actively eroding streambank within the watershed. **Degrade**.

Alternative 2 (Road Stabilization and Watershed Restoration): Removing culverts would generally create some amount of raw bank at the culvert location. This would be a very small amount of disturbance and would likely be seeded with grass seed to prevent any erosion. The potential for increasing the amount of streambank erosion from increased landslide activity associated with failing roads and culverts would be reduced or eliminated. The amount of bank erosion is expected to be **Maintained**.

Floodplain Connectivity: Lack of large wood and past floods that have downcut the stream channel have reduced the floodplain connectivity within the watershed. **At Risk**.

Alternative 1 (No Action): Not implementing any projects would maintain the current streambank condition in the short-term. Increased failure of culverts and road fills are expected as a result of taking no action, which would lead to increased landslide and debris flow activity. Landslides and debris flows could cause downcutting, which would reduce the floodplain connectivity. **Degrade**.

Alternative 2 (Road Stabilization and Watershed Restoration): Removing culverts would generally create some amount of raw bank at the culvert location. This would be a very small amount of disturbance and would likely be seeded with grass seed to prevent any erosion. The potential for increasing the amount of streambank erosion from increased landslide activity associated with failing roads and culverts would be reduced or eliminated. The amount of bank erosion is expected to be **Maintained**.

Watershed Conditions

Road Density and Location: Road density as determined by the BLM is 4.8 miles/mile^2. This estimate may be low due to unmapped roads. Some of the roads are valley bottom and mid-slope. **Not Properly Functioning**.

Alternative 1 (No Action): No action would maintain the current road density and location of roads. **Maintain**.

Alternative 2 (Road Stabilization and Watershed Restoration): Road treatments vary from stabilization to decommissioning by removing culverts and subsoiling the road surface. Decommissioning will reduce road density within the watershed. **Restore**.

Disturbance History and Stream Influence Zone: The upper watershed has been impacted by past logging practices, road building and landslides (both natural and man-caused). The lower watershed has been impacted by agriculture, diking, and removal of riparian vegetation. **Not Properly Functioning**.

Alternative 1 (No Action): No action would maintain the current amount of disturbance and impacts to the stream influence zone in the short-term. In the long-term, increased failure of culverts and road fills are expected as a result of taking no action, which would lead to increased landslide and debris flow activity. Landslides and debris flows would increase the amount of disturbance within the watershed and impact the stream influence zone. Though landslides and debris flows are natural processes, leaving the roads in their current condition is likely to increase the occurrences of these processes above the natural frequency. **Degrade**.

Alternative 2 (Road Stabilization and Watershed Restoration): Stabilizing roads is expected to reduce the failure of culverts and road fill. This would help restore the disturbance and impacts to the stream influence zone within the watershed. **Restore**.

Refugia: Refugia is limited due to the lack of LWD, lack of off-channel habitat and impacts (lack of riparian vegetation and diking) in the lower watershed. **At Risk.**

Alternative 1 (No Action): The amount of refugia would remain the same if no actions were implemented in the short-term. In the long-term, increased failure of culverts and road fills are expected as a result of taking no action, which would lead to increased landslide and debris flow activity. Though landslides and debris flows are natural processes, leaving the roads in their current condition is likely to increase the occurrences of these processes above the natural frequency. This may reduce off-channel habitat and floodplain connectivity, leading to a decrease and fragmentation of refugia. Short-term **Maintain**, long-term **Degrade**.

Alternative 2 (Road Stabilization and Watershed Restoration): Stabilizing and blocking of roads would reduce the potential for landslides and debris flows to occur; some would still occur, but at a more natural frequency. This would help maintain the current amount of refugia within the watershed. **Maintain**.

Reference:

USDI Bureau of Land Management. 1998. Deer Creek, Panther Creek, Willamina Creek and South Yamhill River Watershed Analysis.

ODFW. 1994, 1995 and 1996. Stream Habitat Inventory.

CHECKLIST FOR DOCUMENTING ENVIRONMENTAL BASELINE AND EFFECTS OF PROPOSED ACTION(S) ON RELEVANT INDICATORS AT THE **5TH-FIELD** WATERSHED

Administrative Unit: **Salem District BLM, Tillamook Resource Area**
5th field watershed: **North Yamhill River**
Project: **Yamhill Watershed Road Stabilization and Watershed Restoration**

FACTORS INDICATORS	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)		
	Properly Functioning	At Risk	Not Proper. Functioning	Restore	Maintain	Degrade
Water Quality: Temperature			DEQ, WA		A,B	
Turbidity		WA, PJ		B[2]		A,B[2]
Chem. Contam./Nut.			DEQ, WA		A,B	
Overall (303d reaches)			DEQ, WA		A,B	
Habitat Access: Physical Barriers			WA	B	A	
Habitat Elements: Substrate/Sediment		ODFW		B[2]		A,B[2]
Large Woody Debris (LWD)			ODFW		A[1],B	A[1]
Pool Area %		ODFW			A[1],B	A[1]
Pool Quality	ODFW				A[1],B	A[1]
Pool Frequency		ODFW			A[1],B	A[1]
Off-Channel Habitat			ODFW		A[1],B	A[1]
Channel Cond. & Dyn.: Streambank Condition		ODFW, WA			B,	A
Floodplain Connectivity		WA, PJ			B	A
Watershed Condition: Road Des. & Loc.		BLM		B	A	
Disturbance History			WA, PJ	B		A
Stream Influence Zone			WA, PJ	B		A
Refugia		ODFW, WA, PJ			A[1],B	A[1]

WA = Watershed Analysis
PJ = professional judgement
ODFW= Oregon Department of Fish and Wildlife habitat data
DEQ = Department of Environmental Quality 303d list

A = No Action
B = Road Stabilization/Restoration

[1] = short-term Maintain, long-term Degrade

Data used in this analysis was collected by ODFW on 15.7 miles of stream within the North Yamhill River 5th field watershed. Data was collected in 1993.

Water Quality

Temperature: The North Yamhill River from the mouth to headwaters is on the DEQ 303d list for temperature. **Not Properly Functioning.**

Alternative 1 (No Action): No road stabilization would occur. No change in the current condition of stream water temperature would occur. **Maintain**.

Alternative 2 (Road Stabilization and Watershed Restoration): Vegetation along streams providing canopy cover would not be removed, except possibly at some of the culvert removal sites. These potential areas of vegetation removal would be small and would not impact water temperature. **Maintain**.

Turbidity: No specific information is available on turbidity within the North Yamhill River watershed, however the DEQ lists sediment within the watershed as an area of concern. This indicates that turbidity is likely to be above natural levels as well. **At Risk.**

> **Alternative 1 (No Action)**: There would be no sidecast removal, waterbar construction, or road blocking at this time on the roads proposed for treatment under the action alternatives. These roads would receive little or no maintenance in the future, and would soon become blocked with debris or overgrown with brush. Culverts, cross-drains and ditches would become partly or fully blocked with debris and would either not function at all or function at a reduced level. The end result would be that during winter storms many of these structures would fail and there would be road damage ranging from ditch and road surface erosion to complete road fill failures (landslides). This would lead to direct sediment input into stream channels and likely elevate turbidity levels above natural levels. **Degrade**.
>
> **Alternative 2 (Road Stabilization and Watershed Restoration)**: Stabilizing and blocking of roads would reduce or eliminate the erosion that has been occurring and is expect to occur. Sidecast removal, waterbar construction, culvert removal and ripping roads all have the potential to add sediment to streams and increase turbidity in the short-term. However, by restricting ground-disturbing work to the period of low soil moisture, limiting instream work to ODFW instream work windows, disposing of waste in stable locations away from streams and floodplains, controlling sediment movement with vegetated filter strips or structures such as straw bales, and seeding disturbed areas with native or sterile grass seed, very little, if any, increase in turbidity is anticipated. Over the long-term, stabilizing and decommissioning roads is expected to reduce turbidity within the watershed by minimizing or eliminating impacts (erosion and landslides) from the roads identified for treatment. Possible short-term **Degrade**, long-term **Restore.**

Chemical Contamination/Nutrient Input: The North Yamhill from Turner Creek to headwaters is on the DEQ waterbody of concern list for bacteria, nutrients, toxics and DO. **Not Properly Functioning.**

> **Alternative 1 (No Action)**: No change would occur as a result of not implementing any actions. **Maintain.**
>
> **Alternative 2 (Road Stabilization and Watershed Restoration)**: No change would occur as a result of implementing this action. **Maintain**.

Overall (303d reaches): The North Yamhill from the mouth to headwaters is on the DEQ 303d list for temperature. **Not Properly Functioning.**

> **Alternative 1 (No Action)**: No change in 303d listings is expected as a result of not implementing any actions. **Maintain**.
>
> **Alternative 2 (Road Stabilization and Watershed Restoration)**: No change in 303d listings is expected as a result of implementing this action. **Maintain**.

Habitat Access

Physical Barriers: A number of barriers to fish passage, mainly culverts, were identified in the North Yamhill Watershed Analysis. **Not Properly Functioning**.

> **Alternative 1 (No Action)**: No action would be implemented, therefore any barriers would remain. **Maintain**.
>
> **Alternative 2 (Road Stabilization and Watershed Restoration)**: Many of the roads identified for stabilization are located high in the watershed where streams are generally not fish-bearing due to steep gradient and/or small size, however it is likely that some of the culverts that would be removed are on fish-bearing streams and are currently blocking fish passage. **Restore**.

Habitat Elements

Substrate/Sediment: The riffle substrate is composed of approximately 23% silt and sand, 23.4 % gravel, 23.8%cobble and 29.8%boulder and bedrock. **At Risk.**

Alternative 1 (No Action): There would be no sidecast removal, waterbar construction, or road blocking at this time on the roads proposed for treatment under the action alternatives. These roads would receive little or no maintenance in the future, and would soon become blocked with debris or overgrown with brush. Culverts, cross-drains and ditches would become partly or fully blocked with debris and would either not function at all or function at a reduced level. The end result would be that during winter storms many of these structures would fail and there would be road damage ranging from ditch and road surface erosion to complete road fill failures (landslides). This would lead to direct sediment input into stream channels and likely increase sediment in riffles downstream, as well as increasing bedload movement. **Degrade**.

Alternative 2 (Road Stabilization and Watershed Restoration): Stabilizing and blocking of roads would reduce or eliminate the erosion that is expected (and has been occurring). Sidecast removal, waterbar construction, culvert removal and ripping roads all have the potential to add a small amount of sediment to streams in the short-term. However, by restricting ground-disturbing work to the period of low soil moisture, limiting instream work to ODFW instream work windows, disposing of waste in stable locations away from streams and floodplains, controlling sediment movement with vegetated filter strips or structures such as straw bales, and seeding disturbed areas with native or sterile grass seed, very little, if any, increase in sediment is anticipated. Over the long-term, stabilizing and decommissioning roads is expected to reduce sediment input into streams within the watershed by minimizing or eliminating impacts (erosion and landslides) from the roads identified for treatment. Possible short-term **Degrade**, long-term **Restore.**

Large Woody Debris: Surveyed reaches contain some ODFW key pieces of large woody debris however the ability to calculate the number of pieces per mile is not available from this data set. **Not Properly Functioning**.

Alternative 1 (No Action): Generally, not implementing any actions would maintain the current amount of large wood in the stream channel in the short-term. However as culverts become blocked and/or blow out due to lack of maintenance several things are likely to occur. The culverts currently block the natural movement of large wood downstream. The eventual failure of the culverts and road fills is likely to lead to landslides and debris torrents above natural levels (greater frequency and severity). These may help deliver wood to downstream sites, but they may also move the wood farther through the system than would occur naturally or move the wood out of the stream channel and floodplain. Short-term **Maintain**, possible long-term **Degrade**.

Alternative 2 (Road Stabilization and Watershed Restoration): Stabilizing roads by removing culverts, removing most of the fill over culverts, and adding waterbars would help water and associated debris flow more naturally than if the roads are left in their current condition. Large wood would be moved through the system more naturally, and more wood may be delivered to sites downstream though the total amount of large wood in stream channels throughout the watershed would remain the same. **Maintain**.

Pool Area %: The North Yamhill watershed upland areas are basaltic in origin with the lower slopes and valley floor made up of sedimentary deposits. Pools make up 22% of the stream habitat area. **At Risk**.

Alternative 1 (No Action): There would be no sidecast removal, waterbar construction, road blocking, or road decommissioning at this time on the roads proposed for treatment under the action alternatives. These

roads would receive little or no maintenance in the future, and would soon become blocked with debris or overgrown with brush. Culverts, cross-drains and ditches would become partly or fully blocked with debris and would either not function at all or function at a reduced level. The end result would be that during winter storms many of these structures would fail and there would be road damage ranging from ditch and road surface erosion to complete road fill failures (landslides). This could lead to downcutting of higher gradient stream channels, and excess substrate delivery/deposition in the lower gradient stream channels, both which may lead to a reduction of the amount of pool habitat within the watershed. Short-term **Maintain**, long-term **Degrade**.

Alternative 2 (Road Stabilization and Watershed Restoration): Stabilizing and blocking of roads would reduce the potential for landslides and debris flows to occur; some would still occur, but at a more natural frequency. The current amount of pool habitat would be retained. **Maintain**.

Pool Quality: 26% of the surveyed pools are greater than 1 m deep. **Properly Functioning**.

Alternative 1 (No Action): There would be no sidecast removal, waterbar construction, or road blocking at this time on the roads proposed for treatment under the action alternatives. These roads would receive little or no maintenance in the future, and would soon become blocked with debris or overgrown with brush. Culverts, cross-drains and ditches would become partly or fully blocked with debris and would either not function at all or function at a reduced level. The end result would be that during winter storms many of these structures would fail and there would be road damage ranging from ditch and road surface erosion to complete road fill failures (landslides). This would lead to downcutting of higher gradient stream channels, and excess substrate delivery/deposition in the lower gradient stream channels, both which may lead to a reduction of the amount of quality pool habitat within the watershed. Short-term **Maintain**, long-term **Degrade**.

Alternative 2 (Road Stabilization and Watershed Restoration): Stabilizing and blocking of roads would reduce the potential for landslides and debris flows to occur; some would still occur, but at a more natural frequency. The current amount of quality pool habitat would be retained. **Maintain**.

Pool Frequency: There are approximately 12.5 active channel widths between pools. **At Risk**

Alternative 1 (No Action): There would be no sidecast removal, waterbar construction, or road blocking at this time on the roads proposed for treatment under the action alternatives. These roads would receive little or no maintenance in the future, and would soon become blocked with debris or overgrown with brush. Culverts, cross-drains and ditches would become partly or fully blocked with debris and would either not function at all or function at a reduced level. The end result would be that during winter storms many of these structures would fail and there would be road damage ranging from ditch and road surface erosion to complete road fill failures (landslides). This would lead to downcutting, especially in higher gradient stream channels, and excess substrate delivery/deposition in the lower gradient stream channels, both which may lead to a reduction of the amount of pools within the watershed. Short-term **Maintain**, long-term **Degrade**.

Alternative 2 (Road Stabilization and Watershed Restoration): Stabilizing and blocking of roads would reduce the potential for landslides and debris flows to occur; some would still occur, but at a more natural frequency. The current pool frequency would be retained. **Maintain**.

Off-Channel Habitat: Off-channel habitat makes up approximately 5% of the habitat in surveyed reaches. **Not Properly Functioning**.

Alternative 1 (No Action): The amount of off-channel habitat would remain the same in the short-term if no actions were implemented. In the long-term, increased failure of culverts and road fills are expected as a result of taking no action, which would lead to increased landslide and debris flow activity. Though landslides and debris flows are natural processes, leaving the roads in their current condition is likely to

increase the frequency and severity of these processes above the natural level. This may reduce off-channel habitat though downcutting of stream channels which would reduce floodplain connectivity, and excessive deposition which may fill in alcoves or other off-channel habitat. Short-term **Maintain**, long-term **Degrade**.

Alternative 2 (Road Stabilization and Watershed Restoration): Stabilizing and blocking of roads would reduce the potential for landslides and debris flows to occur; some would still occur, but at a more natural frequency. The current amount of off-channel habitat is expected to be retained. **Maintain**.

Channel Conditions

Streambank Condition: Approximately 36% of streambanks were recorded as actively eroding. **At Risk.**

Alternative 1 (No Action): Not implementing any projects would maintain the current streambank condition in the short-term. Increased failure of culverts and road fills are expected as a result of taking no action, which would lead to increased landslide and debris flow activity. Landslides and debris flows would cause bank erosion, increasing the amount of actively eroding streambank within the watershed. **Degrade**.

Alternative 2 (Road Stabilization and Watershed Restoration): Removing culverts would generally create some amount of raw bank at the culvert location. This would be a very small amount of disturbance and would likely be seeded with grass seed to prevent any erosion. The potential for increasing the amount of streambank erosion from increased landslide activity associated with failing roads and culverts would be reduced or eliminated. The amount of bank erosion is expected to be **Maintained**.

Floodplain Connectivity: The majority of the tributaries flow through confined canyons and though the amount of floodplain is limited, human impacts to these floodplains have also been limited. Floodplains in the lower watershed have been impacted and are lacking connectivity due to agriculture, diking, and removal of riparian vegetation. The watershed is lacking LWD and secondary channels. **At Risk**.

Alternative 1 (No Action): Not implementing any projects would maintain the current streambank condition in the short-term. Increased failure of culverts and road fills are expected as a result of taking no action, which would lead to increased landslide and debris flow activity. Landslides and debris flows could cause downcutting, which would reduce the floodplain connectivity. **Degrade**.

Alternative 2 (Road Stabilization and Watershed Restoration): Removing culverts would generally create some amount of raw bank at the culvert location. This would be a very small amount of disturbance and would likely be seeded with grass seed to prevent any erosion. The potential for increasing the amount of streambank erosion from increased landslide activity associated with failing roads and culverts would be reduced or eliminated. The amount of bank erosion is expected to be **Maintained**.

Watershed Conditions

Road Density and Location: Road density as determined by the BLM is 4.5 miles/mile^2. This estimate may be low due to unmapped roads. Some of the roads are valley bottom and mid-slope. **Not Properly Functioning**.

Alternative 1 (No Action): No action would maintain the current road density and location of roads. **Maintain**.

Alternative 2 (Road Stabilization and Watershed Restoration): Road treatments vary from stabilization to decommissioning by removing culverts and subsoiling the road surface. Decommissioning will reduce road density within the watershed. **Restore**.

Disturbance History and Stream Influence Zone: The upper watershed has been impacted by past logging practices, road building and landslides (both natural and man-caused). The lower watershed has been impacted by agriculture, diking, and removal of riparian vegetation. **Not Properly Functioning**.

> **Alternative 1 (No Action)**: No action would maintain the current amount of disturbance and impacts to the stream influence zone in the short-term. In the long-term, increased failure of culverts and road fills are expected as a result of taking no action, which would lead to increased landslide and debris flow activity. Landslides and debris flows would increase the amount of disturbance within the watershed and impact the stream influence zone. Though landslides and debris flows are natural processes, leaving the roads in their current condition is likely to increase the occurrences of these processes above the natural frequency. **Degrade**.
>
> **Alternative 2 (Road Stabilization and Watershed Restoration)**: Stabilizing roads is expected to reduce the failure of culverts and road fill. This would help restore the disturbance and impacts to the stream influence zone within the watershed. **Restore**.

Refugia: Refugia is limited due to the lack of LWD, lack of off-channel habitat, fish passage barriers, and impacts in the lower watershed from agriculture and residential development (lack of riparian vegetation and diking). **At Risk.**

> **Alternative 1 (No Action)**: The amount of refugia would remain the same if no actions were implemented in the short-term. In the long-term, increased failure of culverts and road fills are expected as a result of taking no action, which would lead to increased landslide and debris flow activity. Though landslides and debris flows are natural processes, leaving the roads in their current condition is likely to increase the occurrences of these processes above the natural frequency. This may reduce off-channel habitat and floodplain connectivity, leading to a decrease and fragmentation of refugia. Short-term **Maintain**, long-term **Degrade**.
>
> **Alternative 2 (Road Stabilization and Watershed Restoration)**: Stabilizing and blocking of roads would reduce the potential for landslides and debris flows to occur; some would still occur, but at a more natural frequency. This would help maintain the current amount of refugia within the watershed. **Maintain**.

References:

ODFW. 1994, 1995, 1997. Stream Habitat Inventory.

CHECKLIST FOR DOCUMENTING ENVIRONMENTAL BASELINE AND EFFECTS OF PROPOSED ACTION(S) ON RELEVANT INDICATORS AT THE 5TH-FIELD WATERSHED

Administrative Unit: **Salem District BLM, Tillamook Resource Area**
5th field watershed: **Lower South Yamhill River**
Project: **Yamhill Watershed Road Stabilization and Watershed Restoration**

FACTORS INDICATORS	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)		
	Properly Functioning	At Risk	Not Proper. Functioning	Restore	Maintain	Degrade
Water Quality: Temperature			DEQ		A,B	
Turbidity			WA,PJ	B[2]		A,B[2]
Chem. Contam./Nut.			WA,PJ		A,B	
Overall (303d reaches)			DEQ		A,B	
Habitat Access: Physical Barriers			WA,PJ	B	A	
Habitat Elements: Substrate/Sediment		ODFW,PJ		B[2]		A,B[2]
Large Woody Debris (LWD)			ODFW,PJ		A[1],B	A[1]
Pool Area %		ODFW,PJ			A[1],B	A[1]
Pool Quality		ODFW,PJ	ODFW,PJ		A[1],B	A[1]
Pool Frequency		ODFW,PJ			A[1],B	A[1]
Off-Channel Habitat			ODFW,PJ		A[1],B	A[1]
Channel Cond. & Dyn.: Streambank Condition		ODFW,PJ			B	A
Floodplain Connectivity			WA,PJ		B	A
Watershed Condition: Road Des. & Loc.			WA,PJ BLM	B	A	
Disturbance History			WA,PJ	B		A
Stream Influence Zone			WA,PJ	B		A
Refugia		WA,PJ			A[1],B	A[1]

WA = Watershed Assessment
PJ = professional judgement
ODFW= Oregon Department of Fish and Wildlife habitat data
DEQ = Department of Environmental Quality 303d list
BLM = BLM data

A = No Action
B = Road Stabilization/Restoration

[1] = short-term Maintain, long-term Degrade
[2] = short-term Degrade, long-term Restore

No habitat data is available for streams within the Lower South Yamhill 5th field watershed, however the Deer Creek, Panther Creek, Willamina Creek and South Yamhill Watershed Analysis (BLM 1998) includes the northern portion of the South Yamhill River in the analysis area. Data is available for portions of the Willamina 5th field watershed which is adjacent to the Lower South Yamhill watershed. General knowledge of the two watersheds suggest they are similar enough to use the available Willamina data to estimate baseline conditions in the Lower South Yamhill watershed where necessary.

Water Quality

Temperature: The Lower South Yamhill River is on the DEQ 303d list for water temperature. The baseline condition for this indicator is rated **Not Properly Functioning**.

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> **Alternative 1 (No Action)**: No road stabilization or restoration would occur. No change in the current condition of stream water temperature would occur. **Maintain**.

Alternative 2 (Road Stabilization and Watershed Restoration): Vegetation along streams providing canopy cover would not be removed, except possibly at some of the culvert removal sites. These potential areas of vegetation removal would be small and would not impact water temperature. **Maintain**.

Turbidity: The Deer Creek, Panther Creek, Willamina Creek and South Yamhill Watershed Analysis (BLM 1998) states that bank erosion is likely a major contributor to stream sediment load, with erosion potential greatest in the lower reaches. In the lower watershed and especially urban areas streambanks are not well vegetated and some are actively eroding. Stream turbidity levels have been observed to be quite high during winter storm events, which is common in this basin. A lack of large woody debris and associated structural elements indicates that sediment storage and routing processes have been disrupted. Data collected by ODFW stream survey in 1991, 1995 and 1996 on Willamina Creek and Coast Creek indicated a stream bank erosion rate of 12%. Watershed analysis states that bank erosion is likely a major contributor to stream sediment load, with erosion potential greatest in the lower reaches. In the lower watershed and especially urban areas streambanks are not well vegetated and some are actively eroding. Stream turbidity levels have been observed to be quite high during winter storm events, which is common in this basin. A lack of large woody debris and associated structural elements in Willamina Creek indicates that sediment storage and routing processes have been disrupted. This indicator is **Not Properly Functioning.**

Alternative 1 (No Action): There would be no sidecast removal, waterbar construction, road blocking, or road decommissioning at this time on the roads proposed for treatment under the action alternatives. These roads would receive little or no maintenance in the future, and would soon become blocked with debris or overgrown with brush. Culverts, cross-drains and ditches would become partly or fully blocked with debris and would either not function at all or function at a reduced level. The end result would be that during winter storms many of these structures would fail and there would be road damage ranging from ditch and road surface erosion to complete road fill failures (landslides). This would lead to direct sediment input into stream channels and likely elevate turbidity levels above natural levels. **Degrade**.

Alternative 2 (Road Stabilization and Watershed Restoration): Stabilizing, blocking and decommissioning of roads would reduce or eliminate the erosion that has been occurring and is expected to occur. Sidecast removal, waterbar construction, culvert removal and ripping roads all have the potential to add sediment to streams and increase turbidity in the short-term. However, by restricting ground-disturbing work to the period of low soil moisture, limiting instream work to ODFW instream work windows, disposing of waste in stable locations away from streams and floodplains, controlling sediment movement with vegetated filter strips or structures such as straw bales, and seeding disturbed areas with native or sterile grass seed, very little, if any, increase in turbidity is anticipated. Over the long-term, stabilizing and decommissioning roads is expected to reduce turbidity within the watershed by minimizing or eliminating impacts (erosion and landslides) from the roads identified for treatment. Possible short-term **Degrade**, long-term **Restore.**

Chemical Contamination/Nutrient Input: The Lower South Yamhill River is on the DEQ 303d list for bacteria, which indicates nutrient input, so this indicator is rated as **Not Properly Functioning**.

Alternative 1 (No Action): No change would occur as a result of not implementing any actions. **Maintain.**

Alternative 2 (Road Stabilization and Watershed Restoration): No change would occur as a result of implementing this action. **Maintain**.

Overall (303d reaches): The Lower South Yamhill River is on the DEQ 303d list for bacteria, temperature and flow modification so this indicator is rated as **Not Properly Functioning**.

Alternative 1 (No Action): No change in 303d listings is expected as a result of not implementing any actions. **Maintain**.

Alternative 2 (Road Stabilization and Watershed Restoration): No change in 303d listings is expected as a result of implementing this action. **Maintain**.

Habitat Access

Physical Barriers: Within the watershed there are barriers to fish passage and as such is considered **Not Properly Functioning**.

Alternative 1 (No Action): No action would be implemented, therefore any barriers would remain. **Maintain**.

Alternative 2 (Road Stabilization and Watershed Restoration): Many of the roads identified for stabilization or decommissioning are located high in the watershed where streams are generally not fish-bearing due to steep gradient and/or small size, however it is likely that some of the culverts that would be removed are on fish-bearing streams and are currently blocking fish passage. **Restore**.

Habitat Elements

Substrate/Sediment: Analysis of ODFW data available for the Willamina Creek Watershed shows sand and organic substrate making up 18.4%, gravel at 41.5%, cobble at 25.2% boulders and bedrock at 15%. This reach is considered **At Risk**

Alternative 1 (No Action): There would be no sidecast removal, waterbar construction, road blocking, or road decommissioning at this time on the roads proposed for treatment under the action alternatives. These roads would receive little or no maintenance in the future, and would soon become blocked with debris or overgrown with brush. Culverts, cross-drains and ditches would become partly or fully blocked with debris and would either not function at all or function at a reduced level. The end result would be that during winter storms many of these structures would fail and there would be road damage ranging from ditch and road surface erosion to complete road fill failures (landslides). This would lead to direct sediment input into stream channels and likely increase sediment in riffles downstream, as well as increasing bedload movement. **Degrade**.

Alternative 2 (Road Stabilization and Watershed Restoration): Stabilizing, blocking and decommissioning of roads would reduce or eliminate the erosion that is expected (and has been occurring). Sidecast removal, waterbar construction, culvert removal and ripping roads all have the potential to add a small amount of sediment to streams in the short-term. However, by restricting ground-disturbing work to the period of low soil moisture, limiting instream work to ODFW instream work windows, disposing of waste in stable locations away from streams and floodplains, controlling sediment movement with vegetated filter strips or structures such as straw bales, and seeding disturbed areas with native or sterile grass seed, very little, if any, increase in sediment is anticipated. Over the long-term, stabilizing and decommissioning roads is expected to reduce sediment input into streams within the watershed by minimizing or eliminating impacts (erosion and landslides) from the roads identified for treatment. Possible short-term **Degrade**, long-term **Restore.**

Large Woody Debris: Due to past timber harvest, valley bottom roads, homesteading activity, fire and other management actions, Willamina Creek is deficient in large woody debris (BLM Watershed Analysis 1998). The standard for key pieces of large wood is 80 pieces/mile that are at least 24 inches in diameter and 50 feet in length. Wood this size was recorded in the ODFW habitat survey in the amount of 17.6 pieces per mile over the 21.7 miles surveyed, which is about 22% of the desired number. For these reasons this indicator is considered **Not Properly Functioning**.

Alternative 1 (No Action): Generally, not implementing any actions would maintain the current amount of large wood in the stream channel in the short-term. However as culverts become blocked and/or blow out due to lack of maintenance several things are likely to occur. The culverts currently block the natural movement of large wood downstream. The eventual failure of the culverts and road fills is likely to lead to landslides and debris torrents above natural levels (greater frequency and severity). These may help deliver wood to downstream sites, but they may also move the wood farther through the system than would occur naturally or move the wood out of the stream channel and floodplain. Short-term **Maintain**, possible long-term **Degrade**.

Alternative 2 (Road Stabilization and Watershed Restoration): Stabilizing roads by removing culverts, removing most of the fill over culverts, and adding waterbars would help water and associated debris flow more naturally than if the roads are left in their current condition. Large wood would be moved through the system more naturally, and more wood may be delivered to sites downstream though the total amount of large wood in stream channels throughout the watershed would remain the same. **Maintain**.

Pool Area %: The upper portions of the Willamina Creek watershed like the Lower South Yamhill are considered for this analysis to be basaltic headlands and these areas are where the data is available, however the lower portion of this watershed are sedimentary in nature. Pools make up 34 % of the stream habitat area in the Willamina Watershed which almost meets the properly functioning standard of 35% pool area . **At Risk**.

Alternative 1 (No Action): There would be no sidecast removal, waterbar construction, road blocking, or road decommissioning at this time on the roads proposed for treatment under the action alternatives. These roads would receive little or no maintenance in the future, and would soon become blocked with debris or overgrown with brush. Culverts, cross-drains and ditches would become partly or fully blocked with debris and would either not function at all or function at a reduced level. The end result would be that during winter storms many of these structures would fail and there would be road damage ranging from ditch and road surface erosion to complete road fill failures (landslides). This could lead to downcutting of higher gradient stream channels, and excess substrate delivery/deposition in the lower gradient stream channels, both which may lead to a reduction of the amount of pool habitat within the watershed. Short-term **Maintain**, long-term **Degrade**.

Alternative 2 (Road Stabilization and Watershed Restoration): Stabilizing, blocking and decommissioning of roads would reduce the potential for landslides and debris flows to occur; some would still occur, but at a more natural frequency. The current amount of pool habitat would be retained. **Maintain**.

Pool Quality: 24% of the surveyed pools are greater than 1 m deep in Willamina Creek Watershed. The Lower South Yamhill watershed is expected to contain similar numbers of quality pools. **At Risk**.

Alternative 1 (No Action): There would be no sidecast removal, waterbar construction, road blocking, or road decommissioning at this time on the roads proposed for treatment under the action alternatives. These roads would receive little or no maintenance in the future, and would soon become blocked with debris or overgrown with brush. Culverts, cross-drains and ditches would become partly or fully blocked with debris and would either not function at all or function at a reduced level. The end result would be that during winter storms many of these structures would fail and there would be road damage ranging from ditch and road surface erosion to complete road fill failures (landslides). This would lead to downcutting of higher gradient stream channels, and excess substrate delivery/deposition in the lower gradient stream channels, both which may lead to a reduction of the amount of quality pool habitat within the watershed. Short-term **Maintain**, long-term **Degrade**.

Alternative 2 (Road Stabilization and Watershed Restoration): Stabilizing, blocking and decommissioning of roads would reduce the potential for landslides and debris flows to occur; some would still occur, but at a more natural frequency. The current amount of quality pool habitat would be retained. **Maintain**.

Pool Frequency: In Willamina Creek Watershed there are approximately 8.1 active channel widths between pools. The Lower South Yamhill watershed is expected to contain similar numbers of pools. **At Risk**

Alternative 1 (No Action): There would be no sidecast removal, waterbar construction, road blocking, or road decommissioning at this time on the roads proposed for treatment under the action alternatives. These roads would receive little or no maintenance in the future, and would soon become blocked with debris or overgrown with brush. Culverts, cross-drains and ditches would become partly or fully blocked with debris and would either not function at all or function at a reduced level. The end result would be that during winter storms many of these structures would fail and there would be road damage ranging from ditch and road surface erosion to complete road fill failures (landslides). This would lead to downcutting, especially in higher gradient stream channels, and excess substrate delivery/deposition in the lower gradient stream channels, both which may lead to a reduction of the amount of pools within the watershed. Short-term **Maintain**, long-term **Degrade**.

Alternative 2 (Road Stabilization and Watershed Restoration): Stabilizing, blocking and decommissioning of roads would reduce the potential for landslides and debris flows to occur; some would still occur, but at a more natural frequency. The current pool frequency would be retained. **Maintain**.

Off-Channel Habitat: There is little to no backwater or off-channel areas within the surveyed reaches of mainstem Willamina Creek and tributaries. The Lower South Yamhill watershed is expected to be in a similar condition. Off- channel habitat makes up virtually none of the habitat in surveyed reaches. **Not Properly Functioning**.

Alternative 1 (No Action): The amount of off-channel habitat would remain the same in the short-term if no actions were implemented. In the long-term, increased failure of culverts and road fills are expected as a result of taking no action, which would lead to increased landslide and debris flow activity. Though landslides and debris flows are natural processes, leaving the roads in their current condition is likely to increase the frequency and severity of these processes above the natural level. This may reduce off-channel habitat though downcutting of stream channels which would reduce floodplain connectivity, and excessive deposition which may fill in alcoves or other off-channel habitat. Short-term **Maintain**, long-term **Degrade**.

Alternative 2 (Road Stabilization and Watershed Restoration): Stabilizing, blocking and decommissioning of roads would reduce the potential for landslides and debris flows to occur; some would still occur, but at a more natural frequency. The current amount of off-channel habitat is expected to be retained. **Maintain**.

Channel Conditions

Streambank Condition: Approximately 12% of streambanks were recorded as actively eroding, however streambank erosion in the lower watershed is noted a concern in Willamina Creek, the Lower South Yamhill would expected to have similar erosion rates. **At Risk.**

Alternative 1 (No Action): Not implementing any projects would maintain the current streambank condition in the short-term. Increased failure of culverts and road fills are expected as a result of taking no action, which would lead to increased landslide and debris flow activity. Landslides and debris flows would cause bank erosion, increasing the amount of actively eroding streambank within the watershed. **Degrade**.

Alternative 2 (Road Stabilization and Watershed Restoration): Removing culverts would generally create some amount of raw bank at the culvert location. This would be a very small amount of disturbance and would likely be seeded with grass seed to prevent any erosion. The potential for increasing the amount

of streambank erosion from increased landslide activity associated with failing roads and culverts would be reduced or eliminated. The amount of bank erosion is expected to be **Maintained**.

Floodplain Connectivity: Floodplain connectivity is rated as **Not Properly Functioning** due to the lack of large wood, a history of log drives and splash damming that has severely restricted access to the floodplain during high flows.

Alternative 1 (No Action): Not implementing any projects would maintain the current streambank condition in the short-term. Increased failure of culverts and road fills are expected as a result of taking no action, which would lead to increased landslide and debris flow activity. Landslides and debris flows could cause downcutting, which would reduce the floodplain connectivity. **Degrade**.

Alternative 2 (Road Stabilization and Watershed Restoration): Removing culverts would generally create some amount of raw bank at the culvert location. This would be a very small amount of disturbance and would likely be seeded with grass seed to prevent any erosion. The potential for increasing the amount of streambank erosion from increased landslide activity associated with failing roads and culverts would be reduced or eliminated. The amount of bank erosion is expected to be **Maintained**.

Watershed Conditions

Road Density and Location: Road density in the Lower South Yamhill Watershed obtained from available BLM data is 2.9 miles/mile^2. This data includes all road ownerships, but only roads currently in the BLM database. Since a portion of the existing roads are not yet in the database, the actual road density is probably higher. Some of the roads are presumed to be valley bottom and midslope roads. **Not Properly Functioning**

Alternative 1 (No Action): No action would maintain the current road density and location of roads. **Maintain**.

Alternative 2 (Road Stabilization and Watershed Restoration): Road treatments vary from stabilization to decommissioning by removing culverts and subsoiling the road surface. Decommissioning will reduce road density within the watershed. **Restore**.

Disturbance History: Road construction, logging, agricultural and residential/urban development have altered or removed vegetation in many locations throughout the watershed (BLM 1998). This indicator is rated as **Not Properly Functioning**.

Alternative 1 (No Action): No action would maintain the current amount of disturbance and impacts to the stream influence zone in the short-term. In the long-term, increased failure of culverts and road fills are expected as a result of taking no action, which would lead to increased landslide and debris flow activity. Landslides and debris flows would increase the amount of disturbance within the watershed and impact the stream influence zone. Though landslides and debris flows are natural processes, leaving the roads in their current condition is likely to increase the occurrences of these processes above the natural frequency. **Degrade**.

Alternative 2 (Road Stabilization and Watershed Restoration): Decommissioning and stabilizing roads is expected to reduce the failure of culverts and road fill. This would help restore the disturbance and impacts to the stream influence zone within the watershed. **Restore**.

Stream Influence Zone: Road construction, logging, agricultural and residential/urban development have altered or removed riparian vegetation on many of the streams in the watershed (BLM 1998). This indicator is rated as **Not Properly Functioning**.

Alternative 1 (No Action): The stream influence zone would remain the same if no actions were implemented in the short-term. In the long-term, increased failure of culverts and road fills are expected as a result of taking no action, which would lead to increased landslide and debris flow activity. Though landslides and debris flows are natural processes, leaving the roads in their current condition is likely to increase the occurrences of these processes above the natural frequency. This may reduce off-channel habitat and floodplain connectivity, leading to a decrease and fragmentation of refugia. Short-term **Maintain**, long-term **Degrade**.

Alternative 2 (Road Stabilization and Watershed Restoration): Stabilizing, blocking and decommissioning of roads would reduce the potential for landslides and debris flows to occur; some would still occur, but at a more natural frequency. This would help maintain the current amount or potentially reduce the amount of stream influence zone that is currently disturbed. **Maintain**.

Refugia: Survey data show that there are areas within the watershed that contain an adequate number of quality pools and some large wood to provide complex habitat. However, there is a lack of off-channel habitat, an overall lack of large wood, and the amount and continuity of refugia is limited. **At Risk**.

Alternative 1 (No Action): The amount of refugia would remain the same if no actions were implemented in the short-term. In the long-term, increased failure of culverts and road fills are expected as a result of taking no action, which would lead to increased landslide and debris flow activity. Though landslides and debris flows are natural processes, leaving the roads in their current condition is likely to increase the occurrences of these processes above the natural frequency. This may reduce off-channel habitat and floodplain connectivity, leading to a decrease and fragmentation of refugia. Short-term **Maintain**, long-term **Degrade**.

Alternative 2 (Road Stabilization and Watershed Restoration): Stabilizing, blocking and decommissioning of roads would reduce the potential for landslides and debris flows to occur; some would still occur, but at a more natural frequency. This would help maintain the current amount of refugia within the watershed. **Maintain**.

References:

Bureau of Land Management. 1998. Deer Creek, Panther Creek, Willamina Creek and South Yamhill Watershed Analysis. 85pp + appendices.

Oregon Department of Fish and Wildlife and USDI Bureau of Land Management. 1996. Stream Habitat Surveys - Willamina Creek. Aquatic Inventories Project, ODFW Research and Development.

APPENDIX 6. Documentation of Consistency with Aquatic Conservation Strategy Objectives for the Yamhill Watershed Road Stabilization and Watershed Restoration Project Alternatives

ACS Objective 1. Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.

Alternative 1 (No Action): The current distribution, diversity and complexity of watershed and landscape-scale features would generally be maintained. However, there would be no sidecast removal, waterbar construction, road blocking, or road decommissioning at this time on the roads proposed for treatment under the action alternatives. These roads would receive little or no maintenance in the future, and would soon become blocked with debris or overgrown with brush. Culverts, cross-drains and ditches would become partly or fully blocked with debris and would either not function at all or function at a reduced level. The end result would be that during winter storms many of these structures would fail and there would be road damage ranging from ditch and road surface erosion to complete road fill failures (landslides). This can lead to downcutting, especially in higher gradient stream channels, and excess substrate delivery/deposition in the lower gradient stream channels, both which may lead to a reduction of the amount of pools within the watershed, and decreasing the complexity of the instream habitat. **Generally maintains, but may retard the attainment of ACS Objective 1.**

Alternative 2 : Stabilizing, blocking and decommissioning of roads would reduce the potential for landslides and debris flows to occur; some would still occur, but at a more natural frequency. The current complexity of the instream habitat would be retained. **Maintains and does not retard or prevent the attainment of ACS Objective 1.**

ACS Objective 2. Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, up slope areas, headwater tributaries, and intact refugia. The network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian dependent species.

Alternative 1: The amount of connectivity and refugia would remain the same if no actions were implemented in the short-term. In the long-term, increased failure of culverts and road fills are expected as a result of taking no action, which would lead to increased landslide and debris flow activity. Though landslides and debris flows are natural processes, leaving the roads in their current condition is likely to increase the occurrences of these processes above the natural frequency. This may reduce the connectivity within the watershed by downcutting of stream channels, reducing off-channel habitat and reducing floodplain connectivity, leading to a decrease and fragmentation of refugia. **Retards Attainment of ACS Objective 2.**

Alternative 2: Stabilizing, blocking and decommissioning of roads would reduce the potential for landslides and debris flows to occur; some would still occur, but at a more natural frequency. This would help maintain the current amount of connectivity and refugia within the watershed, and prevents any further degradation. **Maintains and does not retard or prevent the attainment of ACS Objective 2.**

ACS Objective 3. Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.

Alternative 1: Not implementing this project would maintain the physical integrity of the aquatic system in the short-term. Increased failure of culverts and road fills are expected as a result of taking no action, which would lead to increased landslide and debris flow activity. Landslides and debris flows would cause bank erosion and downcutting of stream channels, which would degrade streambanks and bottom configurations. **Retards Attainment of ACS Objective 3.**

Alternative 2: Removing culverts would generally create some amount of raw bank at the culvert location. This would be a very small amount of disturbance and would likely be seeded with grass seed to prevent any erosion. The potential for increasing the amount of streambank erosion and degrading stream bottom configurations from

increased landslide activity associated with failing roads and culverts would be reduced or eliminated. **Maintains and does not retard or prevent the attainment of ACS Objective 3.**

ACS Objective 4. Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.

Alternative 1: There would be no sidecast removal, waterbar construction, road blocking, or road decommissioning at this time on the roads proposed for treatment under the action alternatives. These roads would receive little or no maintenance in the future, and would soon become blocked with debris or overgrown with brush. Culverts, cross-drains and ditches would become partly or fully blocked with debris and would either not function at all or function at a reduced level. The end result would be that during winter storms many of these structures would fail and there would be road damage ranging from ditch and road surface erosion to complete road fill failures (landslides). This would lead to direct sediment input into stream channels and likely elevate turbidity levels above natural levels, degrading water quality. **Retards Attainment of ACS Objective 4.**

Alternative 2: Stabilizing, blocking and decommissioning of roads would reduce or eliminate the erosion that has been occurring and is expect to occur. Sidecast removal, waterbar construction, culvert removal and ripping roads all have the potential to add sediment to streams and increase turbidity in the short-term. However, by restricting ground-disturbing work to the period of low soil moisture, limiting instream work to ODFW instream work windows, disposing of waste in stable locations away from streams and floodplains, controlling sediment movement with vegetated filter strips or structures such as straw bales, and seeding disturbed areas with native or sterile grass seed, very little, if any, increase in turbidity is anticipated. Over the long-term, and at the watershed scale, stabilizing and decommissioning roads is expected to reduce turbidity within the watershed by minimizing or eliminating impacts (erosion and landslides) from the roads identified for treatment. **Restores ACS Objective 4.**

ACS Objective 5. Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.

Alternative 1: There would be no sidecast removal, waterbar construction, road blocking, or road decommissioning at this time on the roads proposed for treatment under the action alternatives. These roads would receive little or no maintenance in the future, and would soon become blocked with debris or overgrown with brush. Culverts, cross-drains and ditches would become partly or fully blocked with debris and would either not function at all or function at a reduced level. The end result would be that during winter storms many of these structures would fail and there would be road damage ranging from ditch and road surface erosion to complete road fill failures (landslides). This would lead to direct sediment input into stream channels and likely increase sediment in riffles downstream, as well as increasing bedload movement. **Retards Attainment of ACS Objective 5.**

Alternative 2: Stabilizing, blocking and decommissioning of roads would reduce or eliminate the erosion that is expected (and has been occurring). Sidecast removal, waterbar construction, culvert removal and ripping roads all have the potential to add a small amount of sediment to streams in the short-term. However, by restricting ground-disturbing work to the period of low soil moisture, limiting instream work to ODFW instream work windows, disposing of waste in stable locations away from streams and floodplains, controlling sediment movement with vegetated filter strips or structures such as straw bales, and seeding disturbed areas with native or sterile grass seed, very little, if any, increase in sediment is anticipated. Over the long-term, stabilizing and decommissioning roads is expected to reduce sediment input into streams within the watershed by minimizing or eliminating impacts (erosion and landslides) from the roads identified for treatment, and help restore a more natural sediment regime. **Restores ACS Objective 5.**

ACS Objective 6. Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.

Alternative 1: The current condition of in-stream flows would be maintained. **Maintains and does not retard or prevent the attainment of ACS Objective 6.**

Alternative 2: The project would have no impact on instream flows. **Maintains and does not retard or prevent the attainment of ACS Objective 6.**

ACS Objective 7. Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.

Alternative 1: No action would maintain the current amount of floodplain connectivity in the short-term. In the long-term, increased failure of culverts and road fills are expected as a result of taking no action, which would lead to increased landslide and debris flow activity. Landslides and debris flows often lead to downcutting of the stream channel, which generally decreases floodplain connectivity. Though landslides and debris flows are natural processes, leaving the roads in their current condition is likely to increase the occurrences of these processes above the natural frequency and severity. Reducing floodplain connectivity would reduce floodplain innundation and potentially drop the level of the water table at some locations throughout the watersheds. **Retards Attainment of ACS Objective 7.**

Alternative 2: The current amount of floodplain connectivity would be maintained in the short-term and the long- term. Failure of culverts and road fill is expected to be reduced by the proposed action, which would help maintain and prevent any future reduction in floodplain connectivity, and maintain the current timing, variability and duration of floodplain innundation. **Maintains and does not retard or prevent the attainment of ACS Objective 7.**

ACS Objective 8. Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.

Alternative 1: No action would maintain the current species composition and structural diversity of plant communities in riparian areas in the short-term. In the long-term, increased failure of culverts and road fills are expected as a result of taking no action, which would lead to increased landslide and debris flow activity. Landslides and debris flows often lead to downcutting and erosion of the stream channel and may impact riparian areas adjacent to the stream. The structural diversity of the plant communities in these areas may be reduced. Though landslides and debris flows are natural processes, leaving the roads in their current condition is likely to increase the occurrences of these processes above the natural frequency and severity. **Generally maintains, but may retard the attainment of ACS Objective 8.**

Alternative 2: The current species composition and structural diversity of plant communities in riparian areas would be maintained in the short-term and the long-term. Failure of culverts and road fill is expected to be reduced by the proposed action, which would help maintain and prevent any future impacts on riparian habitat and associated plant communities. Some landslides, debris flows and erosion would still occur, but at more natural levels. **Maintains and does not retard or prevent the attainment of ACS Objective 8.**

ACS Objective 9. Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.

Alternative 1: No action would maintain the current amount of riparian habitat in the short-term. In the long-term, increased failure of culverts and road fills are expected as a result of taking no action, which would lead to increased landslide and debris flow activity. Landslides and debris flows often lead to downcutting of the stream channel, which generally decreases floodplain connectivity, would potentially drop the level of the water table at some locations throughout the watersheds, erodes streambanks, and would reduce the amount and complexity of riparian habitat. Though landslides and debris flows are natural processes, leaving the roads in their current condition is likely to increase the occurrences of these processes above the natural frequency and severity. **Retards Attainment of ACS Objective 9.**

Alternative 2: The current amount of riparian habitat would be maintained in the short-term and the long-term. Failure of culverts and road fill is expected to be reduced by the proposed action, which would help maintain and prevent any future reduction in floodplain connectivity, streambank erosion, and riparian habitat. Some landslides, debris flows and erosion would still occur, but at more natural levels. **Maintains and does not retard or prevent the attainment of ACS Objective 9.**

APPENDIX 7 -

Public Comments to the Environmental Assessment OR-086-01-05 and Bureau of Land Management Responses.

(Reserved)